

PATENT ABSTRACTS OF JAPAN

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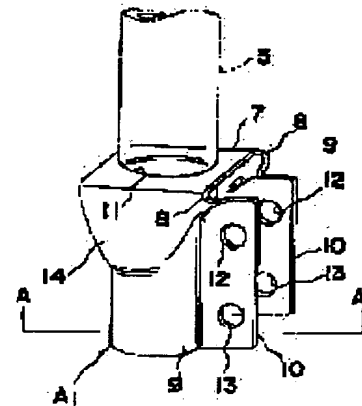
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(54) KNUCKLE BRACKET

(57)Abstract:

PURPOSE: To provide a knuckle bracket not requiring its welding process, not deteriorating anti-fatigue strength of an outer shell but allowing easy boring work for a mounting hole and positioning work therefor, when the outer shell is furnished.

CONSTITUTION: In the case of a knuckle bracket comprising a bracket main body A1 to which an outer shell is furnished, a pair of parallel pinching parts 10 for mounting a knuckle arm stretched in the lateral direction from the bracket main body, and mutually facing mounting holes 12 formed in respective pinching parts, a hole for pressure inserting the lower part of the outer shell is formed on the top end of the bracket main body.



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CLAIMS

[Claim(s)]

[Claim 1] The knuckle bracket characterized by forming the hole for press fit which presses the lower part of outer shell fit in the upper limit of the body of a bracket in the knuckle bracket which consists of a mounting hole which was formed in the pinching section and each pinching section of an parallel pair for the steering-knuckle-arm attachment jutted out over the longitudinal direction, and which carries out phase opposite from the body of a bracket which attaches outer shell, and the body of a bracket.

[Claim 2] The knuckle bracket of claim 1 which the body of a bracket consists of a level piece of support, and the **-like support-from-under section of the pair caudad installed through the flexion from the both sides of the piece of support, is made to jut out the pinching section over a before [each support-from-under section] side, and forms the hole for press fit located on the same axis as the inner circumference of each of said pinching section in the center of said piece of support.

[Claim 3] The knuckle bracket of claim 2 which is making the hole for press fit, and the tubed guide open for free passage protrude on the top face or inferior surface of tongue of the piece of support.

[Claim 4] A tubed guide and the hole for press fit are the upper part or the knuckle bracket of claim 3 which bends caudad and is formed about the center of the piece of support.

[Claim 5] The knuckle bracket of claim 1 which the body of a bracket consists of an parallel piece of support of a vertical pair, and a connection frame which connects the end of each piece of support with one, prepares the pinching section in the other end of each piece of support at one, and forms the hole for press fit of the pair which carries out phase opposite in the center of said piece of support.

[Claim 6] The knuckle bracket of claim 5 which is making the hole for press fit, and the tubed guide open for free passage protrude on the top face or inferior surface of tongue of each piece of support.

[Claim 7] A tubed guide and the hole for press fit are the upper part or the knuckle bracket of claim 7 which bends caudad and is formed about the center of each piece of support.

[Claim 8] The knuckle bracket of claim 1 which forms the hole for press fit in the upper limit of a barrel by welding with a tie-in, the body of a bracket consisting of cross-section semicircle-like barrels, making the pinching section jut out over the before [both ends] side of a barrel, respectively, preparing the piece of a stop in the before [an upper part edge] side of a barrel further, respectively, and making each piece of a stop counter or.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the knuckle bracket used for installation of the strut mold shock absorber which absorbs energy, such as vibration from a road surface, while it is infixed between the car-body side of a car, and a wheel side and carries out the suspension of the car body.

[0002]

[Description of the Prior Art] A strut mold shock absorber consists of a shock absorber inserted into outer shell and outer shell, and the lower part of outer shell is attached near the wheel side of a car, being supported with a knuckle bracket.

[0003] As this kind of a knuckle bracket, what was indicated by JP,58-63506,A, JP,61-13790,Y, the American patent No. 4,491,339 specification, JP,56-160442,A, etc. is known, for example, and what is shown in drawing 10 and drawing 11 is adopted as typical structure.

[0004] this knuckle bracket A -- an outer case -- the **--like support-from-under section 4 which wins the outer shell 3, the pinching sections 5 and 5 of the pair prolonged in parallel towards a before side from this support-from-under section 4, and the mounting holes 1 and 2 established in each pinching sections 5 and 5 towards the longitudinal direction -- since -- the support-from-under section 4 and the pinching sections 5 and 5 are mostly fabricated in the shape of a cross section of U characters seen from the flat surface.

[0005] The lower part of the outer shell 3 which inserted the shock absorber is supported from under in the support-from-under section 4, and the pinching sections 5 and 5 are concluded with the bolt inserted in the bolthole slack mounting holes 1 and 2.

[0006] After the outer shell 3 is attached in the knuckle bracket A as mentioned above, the inner circumference b of the pieces 6 and 6 of support prepared in the vertical edge periphery a of the support-from-under section 4 and the upper part of the pinching sections 5 and 5 is fixed by welding to the external surface of the outer shell 3.

[0007]

[Problem(s) to be Solved by the Invention] However, there are the following faults with the above-mentioned conventional knuckle bracket A.

[0008] ** Since the knuckle bracket A is the cross section-like of U characters, only by binding the pinching sections 5 and 5 tight, the support-from-under force is weak, therefore in order to have to make both the vertical edge periphery of the support-from-under section 4, and both [one side or] of the piece 6 of support weld, workability is bad and causes a cost rise.

Furthermore, when it welds as mentioned above, it has a thermal effect on the part which receives the maximum bending moment of the outer shell 3 at the time of welding, and there is a possibility of reducing the fatigue strength of outer shell.

[0009] ** Since the support-from-under section 4 which constitutes the knuckle bracket A corresponds to the periphery of the outer shell 3, carry out press working of sheet metal of it to the shape of **. When positioning corresponding to an angle of bend and a bending location is difficult at the time of processing of the support-from-under section 4 and an angle of bend and a bending location are out of order, the mounting holes 1, 1, 2, and 2 formed in each pinching

sections 5 and 5 stop for this reason, countering. Therefore, a drilling activity must be done so that a mounting hole 1, and 1, 2 and 2 may always enlarge a mounting hole that it is made to carry out phase opposite or mounting holes 1, 1, 2, and 2 may counter after welding, and it is inferior to workability.

[0010] Then, the purpose of this invention is that make unnecessary welding to the part which receives the maximum bending moment of outer shell in equipping with outer shell, do not reduce fatigue of outer shell and reinforcement, and hole processing and alignment of a mounting hole offer an easy knuckle bracket.

[0011]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the configuration of this invention is characterized by to form the hole for press fit which presses the lower part of outer shell fit in the upper limit of the body of a bracket in the knuckle bracket which consists of a mounting hole which was formed in the pinching section and each pinching section of an parallel pair for the steering-knuckle-arm attachment jutted out over the longitudinal direction, and which carries out phase opposite from the body of a bracket which attaches outer shell, and the body of a bracket.

[0012] In this case, the body of a bracket may consist of a level piece of support, and the *-like support-from-under section of the pair caudad installed through the flection from the both sides of the piece of support, may make the pinching section jut out over a before [each support-from-under section] side, and may form the hole for press fit located on the same axis as the inner circumference of each of said pinching section in the center of said piece of support.

[0013] Furthermore, the hole for press fit and a tubed guide open for free passage may be made to protrude on the top face or inferior surface of tongue of the piece of support, and this tubed guide and the hole for press fit may bend and form the center of the piece of support in the upper part or a lower part.

[0014] It is made similarly to constitute from a connection frame with which the body of a bracket connects the end of the parallel piece of support of a vertical pair, and each piece of support with one. The pinching section may be prepared in the other end of each piece of support at one, and the hole for press fit of the pair which carries out phase opposite may be formed in the center of said piece of support. In this case, as for the tubed guide which makes the hole for press fit, and a tubed guide open for free passage protrude on the top face or inferior surface of tongue of each piece of support, and is in it and which is been and stretched, and the hole for press fit, it is desirable the upper part or to bend caudad and to form the center of each piece of support.

[0015] Furthermore, the body of a bracket consists of cross-section semicircle-like barrels, the pinching section is made to jut out over the before [both ends] side of a barrel, respectively, and the hole for press fit may be further formed in the upper limit of a barrel by welding with a tie-in, preparing the piece of a stop in the before [an upper part edge] side of a barrel, respectively, and making each piece of a stop counter.

[0016] According to the above-mentioned configuration, outer shell is pressed fit in the hole for press fit, and outer shell and a knuckle bracket are combined only by welding the lower part of this outer shell, and the lower part of the body of a bracket. Under the present circumstances, since outer shell is pressed fit in the hole for press fit, it is not necessary to make between the peristome of the hole for this press fit, and outer shell weld.

[0017]

[Embodiment of the Invention] The knuckle bracket of this invention consists of a mounting hole which was formed in the pinching section and each pinching section of an parallel pair for the steering-knuckle-arm attachment jutted over the longitudinal direction out of the body of a bracket which attaches outer shell, and the body of a bracket and which carries out phase opposite, and forms the hole for press fit which presses the lower part of outer shell fit in the upper limit of the body of a bracket.

[0018] For example, drawing 1 and drawing 2 show the gestalt of 1 operation of this invention concerning claim 1, and the purpose of using a knuckle bracket is the same as the above

mentioned conventional technique of drawing 10 .

[0019] Drawing 1 and the knuckle bracket of drawing 2 constitute the body A1 of a bracket from a level piece 7 of support, and the **--like support--from--under sections 9 and 9 of the pair caudad installed through flections 8 and 8 from the right--and--left both sides of the piece 7 of support. And the parallel pinching sections 10 and 10 of a pair jutted out at right angles to a before [each support--from--under sections 9 and 9] side, It has the hole 11 for press fit of the lengthwise direction which is formed in the center of said piece 7 of support, and is located on the same axis as the inner circumference of each of said pinching sections 9 and 9, and the mounting holes 12, 12, 13, and 13 of the longitudinal direction of two steps of upper and lower sides formed in each pinching sections 10 and 10.

[0020] In this case, although flections 8 and 8 and **** 9 and 9 may be formed successively directly, it is desirable to form the bulge section 14 swollen to the method of outside on the way, and to use flections 8 and 8 and the bulge sections 14 and 14 as a rib for reinforcement.

[0021] Although the hole 11 for press fit of a lengthwise direction may dig and form the center of the piece 7 of support, the hole of a lengthwise direction and a tubed guide open for free passage may be made to protrude on the top face of the piece of support, or an inferior surface of tongue, and this tubed guide and the hole of a lengthwise direction may bend and form the center of the piece of support in the upper part or a lower part further.

[0022] As shown in drawing 3 and drawing 4 , in the level piece 7 of support same with drawing 1 , and the support--from--under section 9 Namely, the body A2 of a bracket, Or constitute A3 and the tubed guides 15 and 16 of the die length of the arbitration formed successively to the hole 11 further for press fit of a lengthwise direction are protruded. When the outer shell 3 is pressed fit in the tubed guides 15 and 16 and the hole 11 for press fit, both touch area is enlarged, and it shows around so that outer shell can be pressed fit smoothly.

[0023] With the gestalt of operation of drawing 3 , although the tubed guide 15 is protruded above the piece 7 of support, the tubed guide 15 concerned may be fabricated as another member, and this tubed guide 15 may be stood up and fixed on the piece 7 of support, or a hole may be formed in the center of the piece 7 of support, the periphery section part of this hole may be bent, and you may stand up up.

[0024] On the other hand, although the tubed guide 16 is protruded on the inferior surface of tongue of the piece 7 of support, the center of the piece 7 of support may be bent caudad, and this tubed guide 16 may fabricate it with the gestalt of operation of drawing 4 , as it forms as another member, and this may be combined with the inferior surface of tongue of the piece 7 of support or it is shown in drawing 5 . Other configurations, an operation, and effectiveness are the same as the thing of drawing 1 .

[0025] The outer shell 3 is caudad turned to the hole 11 for press fit of a lengthwise direction, or the tubed guides 15 and 16 and the hole 11 for press fit of a lengthwise direction, and is pressed fit in them, and further, if between the lower part of the outer shell 3 and the lower parts of the support--from--under section 9 is welded, outer shell and a knuckle bracket are combinable only by it with the knuckle bracket concerning the gestalt of operation of drawing 1 thru/or drawing 5 .

[0026] For this reason, it is not necessary to combine the part which counters the hole 11 of a lengthwise direction, i.e., the part which receives the maximum bending moment of the outer shell 3, by welding.

[0027] Furthermore, a wheel side steering knuckle arm is inserted between the pinching section 10 and 10, subsequently to between mounting holes 12, 12, and 13 and 13, if a bolt is inserted and the pinching sections 10 and 10 are bound tight with a nut, the inner circumference of the support--from--under sections 9 and 9 will be close to the periphery of the outer shell 3, and the outer shell 3, and the knuckle brackets A1 and A2 and A3 will be combined more firmly.

[0028] In addition, in the gestalt of operation of drawing 1 , drawing 3 , and drawing 4 , although it may be combined with one, as shown in drawing 2 , it may open and be separated from spacing of arbitration of the posterior part of the support--from--under section.

[0029] Drawing 6 and drawing 7 are what shows the knuckle bracket concerning the gestalt of other operations. Next, this knuckle bracket Body A4 of a bracket and A5 are made to constitute

from parallel pieces 17 and 18 of support of a vertical pair, and a connection frame 19 which connects the end slack back end of each pieces 17 and 18 of support with one, respectively. And the bifurcation pinching sections 20 and 21 of the vertical pair prepared in the before [other end slack] side of each pieces 17 and 18 of support at one, It has the holes 24 and 24 for press fit of the lengthwise direction of the pair which was formed in the center of each of said pieces 17 and 18 of support and which carries out phase opposite, and the mounting holes 29, 29, 30, and 30 of the longitudinal direction formed in each pinching sections 20 and 21.

[0030] Although the hole 24 for press fit of a lengthwise direction may be formed independently, as are shown in drawing 6 , and shown in the top face of each pieces 17 and 18 of support, or drawing 7 , it is desirable to make the hole 24 for press fit of a lengthwise direction, the tubed guides 25 and 26 open for free passage, or 27 and 28 protrude on the inferior surface of tongue of the pieces 17 and 18 of support.

[0031] In this case, although another object is sufficient as the tubed guides 25, 26, 27, and 28, as for the tubed guides 25 and 26, or 27, 28 and the hole 24 for press fit of a lengthwise direction, it is desirable the upper part or to bend caudad and to form the center of each pieces 17 and 18 of support.

[0032] According to the knuckle bracket shown in above-mentioned drawing 6 and drawing 7 , [whether the outer shell 3 is pressed fit in the holes 24 and 24 for press fit of the lengthwise direction of each pieces 17 and 18 of support, and] Or the outer shell 3 is pressed fit in these holes 24 and 24, the tubed guides 25 and 26, or 27 and 28, and the outer shell 3 and a knuckle bracket can be further combined only by welding the lower part of the outer shell 3, the downward hole 24, or the downward tubed guides 26 and 28. For this reason, it is not necessary to combine the part which receives the maximum bending moment of the outer shell 3 by welding.

[0033] Up and down, the pinching sections 20 and 21 counter mutually and are prepared. These pinching sections 20 and 21 The pieces 22, 22, 23, and 23 of pinching which counter, respectively, and the mounting holes 29, 29, 30, and 30 established in the longitudinal direction at these pieces 22, 22, 23, and 23 of pinching, The bolt which inserted the steering knuckle arm by the side of a wheel between a preparation, the piece 22 of pinching, and 22, 23 and 23, and was fitted over mounting holes 29 and 30 is bound tight with a nut, and a knuckle bracket is combined with a steering knuckle arm.

[0034] Drawing 8 is what shows the knuckle bracket concerning the gestalt of other operations of this invention. This knuckle bracket The body A6 of a bracket is constituted from a cross-section semicircle-like barrel 31 by which the before side was opened wide. The pinching sections 32 and 32 which equipped the before [both-ends 31a] side of a barrel 31 with mounting holes 33 and 34, respectively are made to jut out. Furthermore, the pieces 35 and 35 of a stop which carry out phase opposite are formed in the before [an upper part edge] side of the upper part slack barrel 31 from the pinching sections 32 and 32. The hole 37 for press fit of depth L is formed in the upper limit of a barrel 31 by combining central 36 comrade of each pieces 35 and 35 of a stop by the spot or projection welding.

[0035] In this case, by making the piece 35 of a stop, and 35 comrades counter, and joining together, the upper part edge of a barrel 31 narrows, the body of depth L corresponding to the die length of the lengthwise direction of the piece 35 of a stop is formed, and this body constitutes the hole 37 for press fit.

[0036] The level rib 40 prolonged towards the inner direction in the up end face of the pinching sections 32 and 32 is formed in one, the edge of this rib 40 forms successively to the lower limit of the piece 35 of a stop, and the rise on the strength is achieved.

[0037] The outer shell 3 is pressed fit in the hole 37 for press fit, and being combined by welding is [the lower limit section perimeter of the outer shell 3 concerned, and the lower limit periphery of a barrel 31] desirable. However, since it is pressed fit in the hole 37 for press fit, the outer shell 3 does not need to weld between the periphery of the hole 37 for this press fit, and the periphery of the outer shell 3.

[0038] Drawing 9 shows the gestalt of other operations of this invention, and the pieces 39 and 40 of a stop which meet the before [an upper part edge] side of a barrel 31 at a circumferential

direction are formed, and by assorting these two pieces 39 and 40 of a stop, and combining the center 36 by the spot or projection welding, this narrows the upper part edge of a barrel 31, and forms the hole 38 for press fit corresponding to the body of depth L. Other configurations, an operation, and effectiveness are the same as the gestalt of operation of drawing 8 R> 8, and the same configuration is omitted for details by attaching the same sign.

[0039]

[Effect of the Invention] According to this invention, there is the following effectiveness.

[0040] ** According to invention of each claim, since the hole for press fit which presses the lower part of outer shell fit in the upper limit of the body of a bracket is prepared and outer shell was pressed fit in this hole, it is not necessary to weld the part which receives the maximum bending moment of outer shell, it can combine outer shell and a knuckle bracket only by press fit, and its workability improves. Moreover, since it is not necessary to weld the above-mentioned part, workability can improve, a cost cut can be aimed at and the fault of the fall of the fatigue strength of the outer shell accompanying the thermal effect at the time of welding can be canceled further.

[0041] ** According to invention of claim 2, since it has the support-from-under section and the pinching section, by binding the support-from-under section tight, it collaborates with the hole for press fit, and outer shell can be held more firmly.

[0042] ** according to invention of claims 2, 3, and 4, since it has the flection, this flection carries out rib appearance and the rigid rise and the rise on the strength by effectiveness can be aimed at.

[0043] ** According to invention of claims 2, 3, and 4, since a setup of the angle of bend of a flection or the support-from-under section and a bending location is easy since it regards as a level piece, a flection, and the support-from-under section from a transverse plane and is fabricated in the shape of about U characters, and it is stabilized, alignment of the mounting hole of the pinching section can be performed correctly, hole processing of a mounting hole is easy and workability improves.

[0044] ** According to invention of claims 3 and 4, since the touch area to outer shell becomes large, and holding power improves, since the tubed guide formed successively to the hole for press fit is prepared, and it shows outer shell to a lengthwise direction, press fit actuation also becomes easy.

[0045] ** According to invention of claim 5, from the hole for press fit being formed in the up-and-down piece of support, it supports by the inner circumference of the upper and lower sides of the periphery of the outer shell pressed fit, and outer shell can be held perpendicularly and certainly.

[0046] ** According to invention of claims 6 and 7, since it has the tubed guide up and down, a touch area with outer shell becomes large, outer shell is smoothly guided at the time of press fit, and outer shell can be stood up more to accuracy.

[0047] ** According to invention of claims 5, 6, and 7, the body of a bracket is constituted from an up-and-down level piece and an up-and-down connection frame, since a member on either side becomes unnecessary, workability improves, and saving of an ingredient can be attained.

[0048] ** since the hole for press fit can be formed only by combining the piece of a stop according to invention of claim 8 -- a hole -- processing is easy. And since the hole for press fit of the depth corresponding to the die length of the piece of a stop can be formed, a touch area with outer shell becomes large, and concentration of stress can be prevented.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view of the knuckle bracket concerning the gestalt of operation of this invention.

[Drawing 2] It is the A-A line crossing bottom view of the knuckle bracket of drawing 1 .

[Drawing 3] It is the perspective view of the knuckle bracket similarly applied to the gestalt of other operations of this invention.

[Drawing 4] It is the perspective view of the knuckle bracket similarly applied to the gestalt of other operations of this invention.

[Drawing 5] It is the C-C line vertical section partial side elevation of drawing 4 .

[Drawing 6] It is the perspective view of the knuckle bracket concerning the gestalt of other operations of this invention.

[Drawing 7] It is the perspective view of the knuckle bracket similarly applied to the gestalt of other operations of this invention.

[Drawing 8] It is the perspective view of the knuckle bracket similarly applied to the gestalt of other operations of this invention.

[Drawing 9] some knuckle brackets similarly applied to the gestalt of other operations of this invention -- it is a notch perspective view.

[Drawing 10] It is the perspective view of the conventional knuckle bracket.

[Drawing 11] It is the B-B line crossing bottom view of drawing 10 .

[Description of Notations]

7 Piece of Support

8 Flection

9 Support-from-under Section

10 Pinching Section

11 Hole for Press Fit

12 13 Mounting hole

15 16 Tubed guide

19 Connection Frame

20 21 Pinching section

24 Hole for Press Fit

25, 26, 27, 28 Tubed guide

29 30 Mounting hole

32 Pinching Section

34 Mounting Hole

37 Hole for Press Fit

38 Hole for Press Fit

A1, A2, A3 Body of a bracket

A4, A5, A6 Body of a bracket

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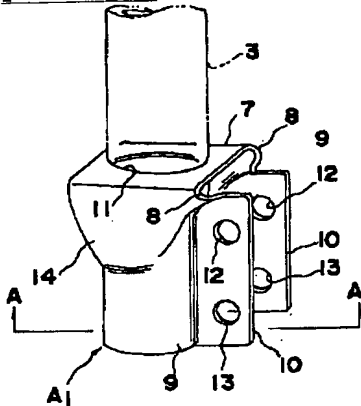
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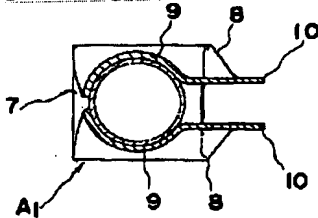
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DRAWINGS

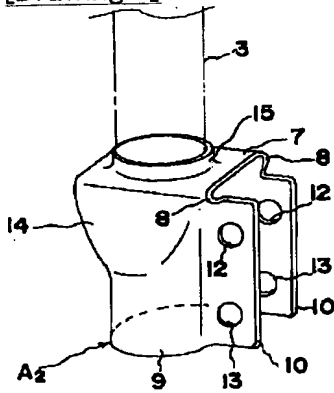
[Drawing 1]



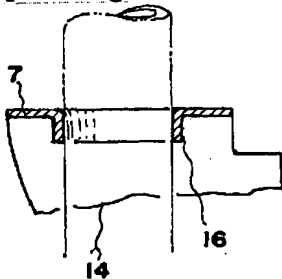
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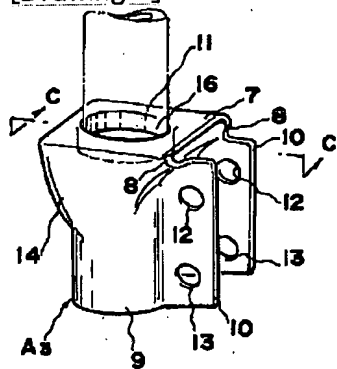
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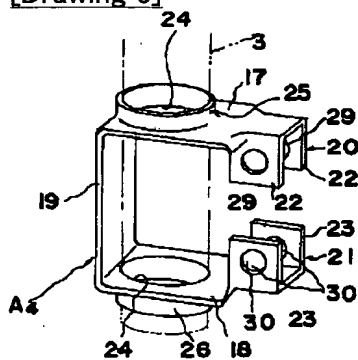
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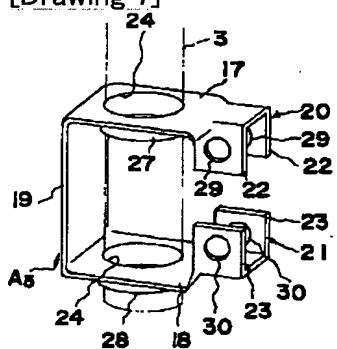
[Drawing 4]



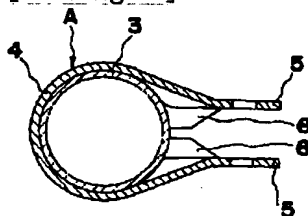
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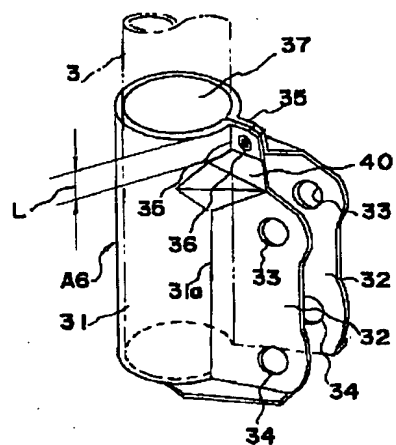
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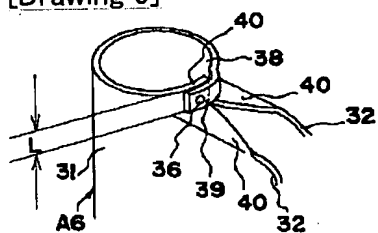
[Drawing 11]



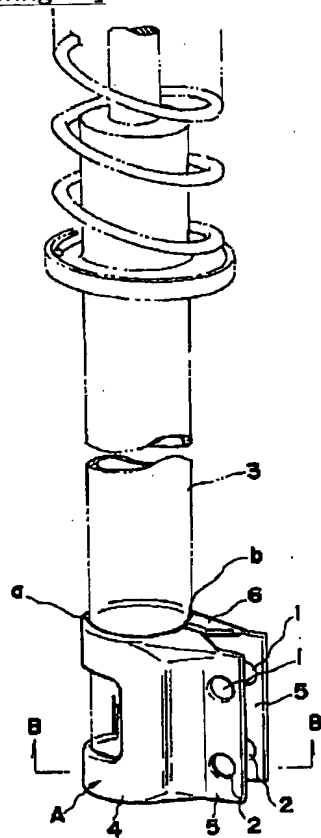
[Drawing 8]



[Drawing 9]



[Drawing 10]



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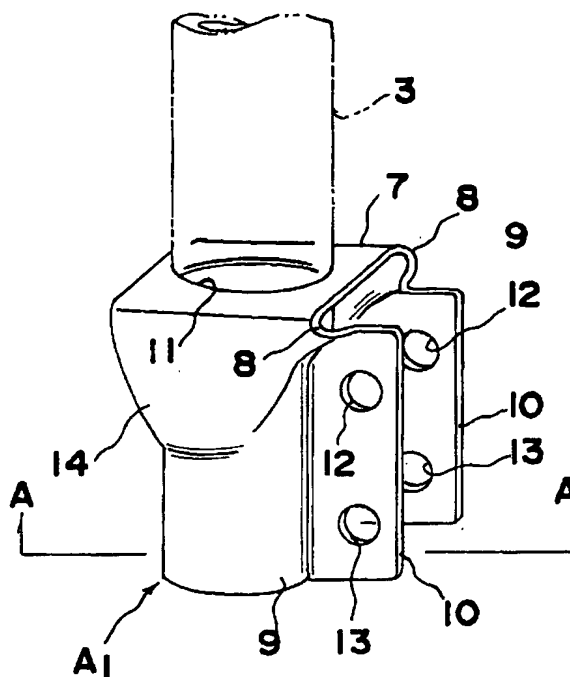
(74)代理人 弁理士 天野 泉

(54)【発明の名称】 ナックルブラケット

(57)【要約】

【課題】 アウターシェルを装着することに当り、溶接を不要とし、アウターシェルの疲労、強度を低下させず、取付孔の孔加工と位置合せが容易なナックルブラケットを提供すること。

【解決手段】 アウターシェルを取付けるブラケット本体A1、A2、A3、A4、A5、A6と、ブラケット本体から横方向に張出したナックルアーム取付用の平行な一対の挟持部10、20、21、32と、各挟持部に形成した相対向する取付孔12、13、29、30、34とからなるナックルブラケットにおいて、ブラケット本体の上端にアウターシェルの下方を圧入する圧入用の孔を形成したことを特徴とする。



【特許請求の範囲】

【請求項1】 アウターシェルを取付けるブラケット本体と、ブラケット本体から横方向に張出したナックルアーム取付用の平行な一対の挟持部と、各挟持部に形成した相対向する取付孔とからなるナックルブラケットにおいて、ブラケット本体の上端にアウターシェルの下方を圧入する圧入用の孔を形成したことを特徴とするナックルブラケット。

【請求項2】 ブラケット本体が水平な支持片と、支持片の両側から屈曲部を介して下方に垂設した一対の弯状抱持部とで構成され、各抱持部の前側に挟持部を張出させ、前記支持片の中央に前記各挟持部の内周と同一軸線上に位置する圧入用の孔を形成している請求項1のナックルブラケット。

【請求項3】 支持片の上面又は下面に圧入用の孔と連通する筒状ガイドを突設させている請求項2のナックルブラケット。

【請求項4】 筒状ガイドと圧入用の孔とが支持片の中央を上方又は下方に折り曲げて形成されている請求項3のナックルブラケット。

【請求項5】 ブラケット本体が上下一対の平行な支持片と、各支持片の一端を一体に連結する連結フレームとで構成され、各支持片の他端に挟持部を一体に設け、前記支持片の中央に相対向する一対の圧入用の孔を形成している請求項1のナックルブラケット。

【請求項6】 各支持片の上面又は下面に圧入用の孔と連通する筒状ガイドを突設させている請求項5のナックルブラケット。

【請求項7】 筒状ガイドと圧入用の孔とが各支持片の中央を上方又は下方に折り曲げて形成されている請求項7のナックルブラケット。

【請求項8】 ブラケット本体が断面半円状の筒体で構成され、筒体の両端部前側にそれぞれ挟持部を張出させ、更に筒体の上方端部前側にそれぞれ係止片を設け、各係止片を対向させながら又は抱き合せながら溶接することにより筒体の上端に圧入用の孔を形成している請求項1のナックルブラケット。

【発明の詳細な説明】

【0001】

【発明が属する技術分野】 本発明は、車両の車体側と車輪側間に介装されて車体を懸架すると共に路面からの振動等のエネルギーを吸収するストラット型ショックアブソーバの取り付けに使用されるナックルブラケットに関する。

【0002】

【従来の技術】 ストラット型ショックアブソーバは、アウターシェルとアウターシェル内に挿入したショックアブソーバとからなり、アウターシェルの下部はナックルブラケットで支持されながら車両の車輪側近くに取り付けられている。

【0003】 この種のナックルブラケットとしては、例えば、特開昭58-63506号公報、実公昭61-13790号公報、アメリカ合衆国特許第4,491,339号明細書、特開昭56-160442号公報等に表示されたものが知られ、代表的な構造として、例えば、図10及び図11に示すものが採用されている。

【0004】 このナックルブラケットAは、外筒たるアウターシェル3を抱き込む弯状抱持部4と、この抱持部4から前側に向けて平行に延びる一対の挟持部5、5と、各挟持部5、5に横方向に向けて設けた取付孔1、2と、からなり、抱持部4と挟持部5、5とは平面からみてほぼ断面U字状に成形されている。

【0005】 ショックアブソーバを挿入したアウターシェル3の下部は、抱持部4で抱持され、挟持部5、5は、ボルト孔たる取付孔1、2に挿入したボルトで締結されるものである。

【0006】 アウターシェル3が上記のようにナックルブラケットAに取り付けられた後に、抱持部4の上下端周縁aと挟持部5、5の上部に設けた支持片6、6の内周bがアウターシェル3の外面对して溶接で固定される。

【0007】

【発明が解決しようとする課題】 しかし、上記従来のナックルブラケットAでは、次のような不具合がある。

【0008】 ①ナックルブラケットAは、断面U字状である為に挟持部5、5を締付けただけでは抱持力が弱く、そのために抱持部4の上下端周縁と、支持片6の内周との一方又は両方を溶接させなければならないために作業性が悪く、コストアップの原因となる。更に、上記のように溶接すると、溶接時にアウターシェル3の最大曲げモーメントを受ける部分に熱影響を与え、アウターシェルの疲労強度を低下させるおそれがある。

【0009】 ②ナックルブラケットAを構成する抱持部4は、アウターシェル3の外周に対応するため弯状にプレス加工させている。このため、抱持部4の加工時に曲げ角度、曲げ位置に対応する位置決めが難しく、曲げ角度や曲げ位置が狂うと各挟持部5、5に形成する取付孔1、1、2、2が対向しなくなる。従って、常に取付孔1と1、2と2が相対向するようにするに取付孔を大きくするか、又は、溶接後に取付孔1、1、2、2が対向するように穿設作業を行わなければならない、加工性に劣るものである。

【0010】 そこで、本発明の目的は、アウターシェルを装着することに当り、アウターシェルの最大曲げモーメントを受ける部分に対する溶接を不要とし、アウターシェルの疲労、強度を低下させず、取付孔の孔加工と位置合せが容易なナックルブラケットを提供することである。

【0011】

【課題を解決するための手段】 上記の目的を達成するた

め、本発明の構成は、アウターシェルを取付けるブラケット本体と、ブラケット本体から横方向に張出したナックルアーム取付用の平行な一対の挟持部と、各挟持部に形成した相対向する取付孔とからなるナックルブラケットにおいて、ブラケット本体の上端にアウターシェルの下方を圧入する圧入用の孔を形成したことを特徴とするものである。

【0012】この場合、ブラケット本体が水平な支持片と、支持片の両側から屈曲部を介して下方に垂設した一対の湾状抱持部とで構成され、各抱持部の前側に挟持部

【0013】更に、支持片の上面又は下面に圧入用の孔と連通する筒状ガイドを突設させてもよく、この筒状ガイドと圧入用の孔とが支持片の中央を上方又は下方に折り曲げて形成してもよい。

【0014】同様に、ブラケット本体が上下一対の平行な支持片と、各支持片の一端を一体に連結する連結フレームとで構成させ、各支持片の他端に挟持部を一体に設け、前記支持片の中央に相対向する一対の圧入用の孔を

【0015】更に、ブラケット本体が断面半円状の筒体で構成され、筒体の両端部前側にそれぞれ挟持部を張出させ、更に、筒体の上方端部前側にそれぞれ係止片を設け、各係止片を対向させながら、又は、抱き合せながら溶接することにより筒体の上端に圧入用の孔を形成してもよい。

【0016】上記の構成によれば、圧入用の孔にアウターシェルを圧入し、このアウターシェルの下方とブラケット本体の下方とを溶接するだけでアウターシェルとナックルブラケットとが結合される。この際、圧入用の孔にはアウターシェルが圧入されているからこの圧入用の孔の口縁とアウターシェルとの間を溶接させる必要がない。

【0017】

【発明の実施の形態】本発明のナックルブラケットは、アウターシェルを取付けるブラケット本体と、ブラケット本体から横方向に張出したナックルアーム取付用の平行な一対の挟持部と、各挟持部に形成した相対向する取付孔とからなり、ブラケット本体の上端にアウターシェルの下方を圧入する圧入用の孔を形成したものである。

【0018】例えば、図1及び図2は、請求項1に係る本発明の一実施の形態を示すもので、ナックルブラケットの使用目的は、前記した図10の従来技術と同じである。

【0019】図1及び図2のナックルブラケットは、水平な支持片7と、支持片7の左右両側から屈曲部8、8

を介して下方に垂設した一対の湾状抱持部9、9とでブラケット本体A1を構成しており、且つ、各抱持部9、9の前側に垂直に張出した平行な一対の挟持部10、10と、前記支持片7の中央に形成され前記各挟持部9、9の内周と同一軸線上に位置する縦方向の圧入用の孔11と、各挟持部10、10に形成した上下二段の横方向の取付孔12、12、13、13と、を備えている。

【0020】この場合、屈曲部8、8と持部9、9とは直接連設してもよいが、途中に外方に膨らました膨出部14を設け、屈曲部8、8と膨出部14、14とを補強用のリブとして利用するのが好ましい。

【0021】縦方向の圧入用の孔11は支持片7の中央を穿って形成してもよいが、支持片の上面、又は、下面に縦方向の孔と連通する筒状ガイドを突設させてもよく、さらに、この筒状ガイドと縦方向の孔とが支持片の中央を上方、又は、下方に折り曲げて形成してもよい。

【0022】即ち、図3及び図4に示すように、図1と同じく水平な支持片7と抱持部9とでブラケット本体A2、又は、A3を構成し、更に、縦方向の圧入用の孔11に連設する任意の長さの筒状ガイド15、16を突設し、筒状ガイド15、16と圧入用の孔11とにアウターシェル3を圧入した時、両者の接触面積を大きくし、且つ、スムーズにアウターシェルを圧入できるように案内するものである。

【0023】図3の実施の形態では、筒状ガイド15を支持片7の上方に突設するが、当該筒状ガイド15を別部材として成形し、この筒状ガイド15を支持片7上に起立して固定してもよく、又は、支持片7の中央に孔を形成し、この孔の円周部部位を折り曲げて上方に起立してもよい。

【0024】他方、図4の実施の形態では、筒状ガイド16を支持片7の下面に突設したものであるが、この筒状ガイド16は、別部材として成形し、これを支持片7の下面に結合してもよく、又は、図5に示すように、支持片7の中央を下方に折り曲げて成形してもよい。他の構成、作用、効果は図1のものと同じである。

【0025】図1乃至図5の実施の形態に係るナックルブラケットでは、縦方向の圧入用の孔11、又は、筒状ガイド15、16と縦方向の圧入用の孔11とにアウターシェル3を下方に向けて圧入し、更に、アウターシェル3の下部と抱持部9の下部との間を溶接するとそれだけでアウターシェルとナックルブラケットとを結合できる。

【0026】このために、縦方向の孔11に対向する部分、即ち、アウターシェル3の最大曲げモーメントを受ける部分を溶接で結合させる必要がない。

【0027】更に、挟持部10、10間に車輪側ナックルアームを挿入し、次いで、取付孔12、12、13、13間にボルトを挿入し、ナットで挟持部10、10を締付けると抱持部9、9の内周がアウターシェル3の外

周に密接し、アウターシェル3とナックルブラケットA 1, A 2, A 3とがより強固に結合される。

【0028】尚、図1、図3及び図4の実施の形態において、抱持部の後部は、一体に結合されていてもよいが、図2に示すように任意の間隔をあけて離れていてもよい。

【0029】次に、図6及び図7は、他の実施の形態に係るナックルブラケットを示すもので、このナックルブラケットは、上下一対の平行な支持片17, 18と、各支持片17, 18の一端たる後端を一体に連結する連結
10 フレーム19とでブラケット本体A 4, A 5をそれぞれ構成させ、且つ、各支持片17, 18の他端たる前側に一体に設けた上下一対の二又状の挟持部20, 21と、前記各支持片17, 18の中央に形成した相対向する一対の縦方向の圧入用の孔24, 24と、各挟持部20, 21に形成した横方向の取付孔29, 29, 30, 30と、を備えている。

【0030】縦方向の圧入用の孔24は、単独に設けてもよいが、図6に示すように、各支持片17, 18の上面、又は、図7に示すように、支持片17, 18の下面
20 に縦方向の圧入用の孔24と連通する筒状ガイド25, 26又は27, 28を突設させるのが好ましい。

【0031】この場合、筒状ガイド25, 26, 27, 28は別体でもよいが、筒状ガイド25, 26又は27, 28と縦方向の圧入用の孔24とが各支持片17, 18の中央を上方又は下方に折り曲げて形成するのが好ましい。

【0032】上記図6及び図7に示すナックルブラケットによれば、各支持片17, 18の縦方向の圧入用の孔24, 24にアウターシェル3を圧入するか、又は、この孔24, 24と筒状ガイド25, 26、又は、27, 28にアウターシェル3を圧入し、更に、アウターシェル3の下部と下方の孔24、又は、下方の筒状ガイド26, 28とを溶接するだけでアウターシェル3とナックルブラケットとが結合できる。この為、アウターシェル3の最大曲げモーメントを受ける部分を溶接で結合させる必要がない。

【0033】挟持部20, 21は、上下に互いに対向して設けられており、この挟持部20, 21は、それぞれ対向する挟持片22, 22, 23, 23と、この挟持片
40 22, 22, 23, 23に横方向に設けた取付孔29, 29, 30, 30と、を備え、挟持片22と22, 23と23との間に車輪側のナックルアームを差し込み、取付孔29, 30に差し込んだボルトをナットで締付けてナックルアームにナックルブラケットを結合するものである。

【0034】図8は、本発明の他の実施の形態に係るナックルブラケットを示すもので、このナックルブラケットは、前側が開放された断面半円状の筒体31でブラケット本体A 6を構成し、筒体31の両端部31a前側に
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それぞれ取付孔33, 34を備えた挟持部32, 32を張出させ、更に、挟持部32, 32より上方の部位たる筒体31の上方端部前側に相対向する係止片35, 35を設け、各係止片35, 35の中央36同志をスポット又はプロジェクション溶接で結合することにより筒体31の upper 端に深さLの圧入用の孔37を形成したものである。

【0035】この場合、係止片35, 35同志を対向させて結合することにより筒体31の上方端部が狭まって係止片35の縦方向の長さに対応する深さLの円筒部が形成され、この円筒部が圧入用の孔37を構成する。

【0036】挟持部32, 32の上部基端には内方に向けて延びる水平なリブ40が一体に設けられ、このリブ40の端部が係止片35の下端に連設して強度アップが図られている。

【0037】アウターシェル3は、圧入用の孔37に圧入され、当該アウターシェル3の下端部周囲と筒体31の下端周縁とは溶接で結合されるのが好ましい。しかし、アウターシェル3は、圧入用の孔37に圧入されているからこの圧入用の孔37の周縁とアウターシェル3の外周との間は溶接する必要がない。

【0038】図9は、本発明の他の実施の形態を示し、これは、筒体31の上方端部前側に円周方向に沿う係止片39, 40を設け、これら、二つの係止片39, 40を抱き合わせてその中央36をスポット、又は、プロジェクション溶接で結合することにより筒体31の上方端部を狭めて深さLの円筒部に対応する圧入用の孔38を形成したものである。その他の構成、作用、効果は、図8の実施の形態と同じであり、同じ構成は、同一の符号を付すことで詳細は省略する。

【0039】

【発明の効果】本発明によれば、次の効果がある。

【0040】①各請求項の発明によれば、ブラケット本体の upper 端にアウターシェルの下方を圧入する圧入用の孔を設け、この孔にアウターシェルを圧入するようにしたからアウターシェルの最大曲げモーメントを受ける部分は溶接する必要がなく、圧入のみでアウターシェルとナックルブラケットを結合でき作業性が向上する。又、上記の部分
を溶接する必要がないので、作業性が向上し、コストダウンを図れ、更に、溶接時の熱影響に伴うアウターシェルの疲労強度の低下という不具合を解消できる。

【0041】②請求項2の発明によれば、抱持部と挟持部とを備えているから抱持部を締付けることにより圧入用の孔と協働してより強固にアウターシェルを保持できる。

【0042】③請求項2, 3, 4の発明によれば、屈曲部を備えているから、この屈曲部がリブ出し効果による剛性アップと強度アップを図れる。

【0043】④請求項2, 3, 4の発明によれば、水平

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片と屈曲部と抱持部とは正面から見てほぼU字状に成形されているから屈曲部や抱持部の曲げ角度、曲げ位置の設定が容易で安定するから挟持部の取付孔の位置合せが正確に出来、取付孔の孔加工が容易で加工性が向上する。

【0044】⑤請求項3、4の発明によれば、圧入用の孔に連設する筒状ガイドが設けられているから、アウターシェルに対する接触面積が大きくなって保持力が向上し、且つアウターシェルを縦方向に案内するから圧入操作も容易となる。

【0045】⑥請求項5の発明によれば、上下の支持片に圧入用の孔が形成されていることから、圧入されたアウターシェルの外周を上下の内周で支持し、アウターシェルを垂直且つ確実に保持できる。

【0046】⑦請求項6、7の発明によれば、上下に筒状ガイドを備えているからアウターシェルとの接触面積が大きくなり、圧入時アウターシェルをスムーズに案内し、より正確にアウターシェルを起立できる。

【0047】⑧請求項5、6、7の発明によれば、上下の水平片と連結フレームとでブラケット本体を構成し、左右の部材が不要となるから加工性が向上し、材料の節約が達成できる。

【0048】⑨請求項8の発明によれば、係止片を結合するだけで圧入用の孔が形成できるから孔加工が容易である。しかも、係止片の長さに対応する深さの圧入用の孔が形成できるからアウターシェルとの接触面積が大きくなり、応力の集中を防止できる。

【図面の簡単な説明】

【図1】本発明の実施の形態に係るナックルブラケットの斜視図である。

【図2】図1のナックルブラケットのA-A線横断底面図である。

【図3】同じく本発明の他の実施の形態に係るナックル

8

ブラケットの斜視図である。

【図4】同じく本発明の他の実施の形態に係るナックルブラケットの斜視図である。

【図5】図4のC-C線縦断部分側面図である。

【図6】本発明の他の実施の形態に係るナックルブラケットの斜視図である。

【図7】同じく本発明の他の実施の形態に係るナックルブラケットの斜視図である。

【図8】同じく本発明の他の実施の形態に係るナックルブラケットの斜視図である。

【図9】同じく本発明の他の実施の形態に係るナックルブラケットの一部切欠き斜視図である。

【図10】従来のナックルブラケットの斜視図である。

【図11】図10のB-B線横断底面図である。

【符号の説明】

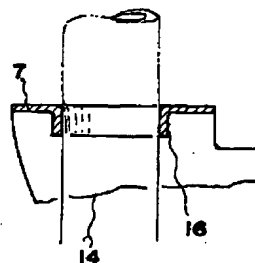
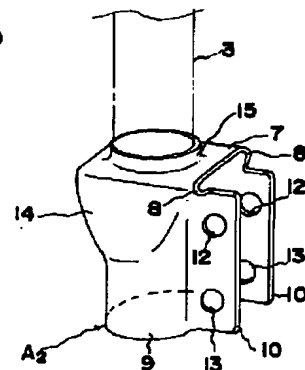
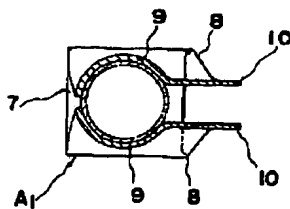
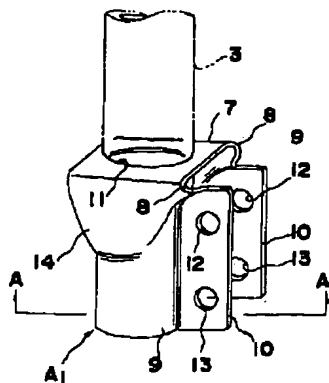
- 7 支持片
- 8 屈曲部
- 9 抱持部
- 10 挟持部
- 11 圧入用の孔
- 12, 13 取付孔
- 15, 16 筒状ガイド
- 19 連結フレーム
- 20, 21 挟持部
- 24 圧入用の孔
- 25, 26, 27, 28 筒状ガイド
- 29, 30 取付孔
- 32 挟持部
- 34 取付孔
- 37 圧入用の孔
- 38 圧入用の孔
- A1, A2, A3 ブラケット本体
- A4, A5, A6 ブラケット本体

【図1】

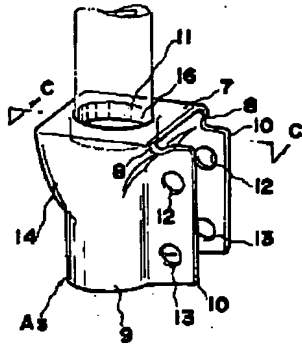
【図2】

【図3】

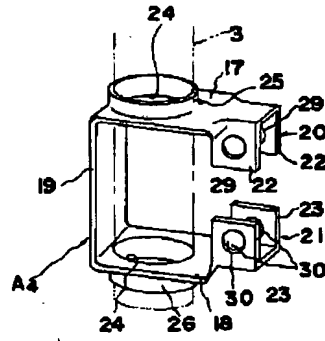
【図5】



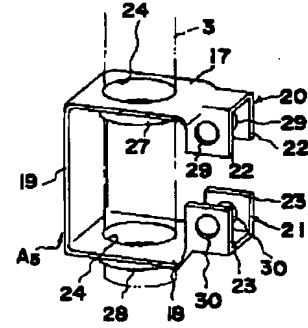
【図4】



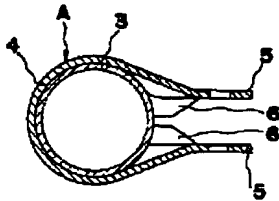
【図6】



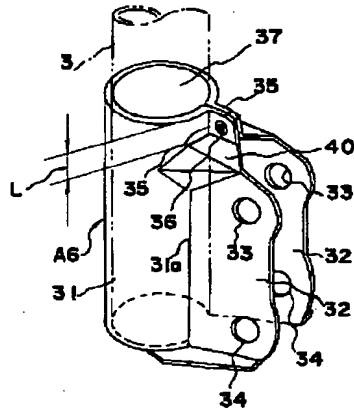
【図7】



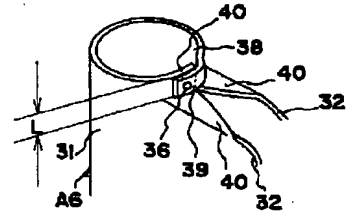
【図11】



【図8】



【図9】



【図10】

